

Restoring with Beaver

Year 5 monitoring of a stream restoration site

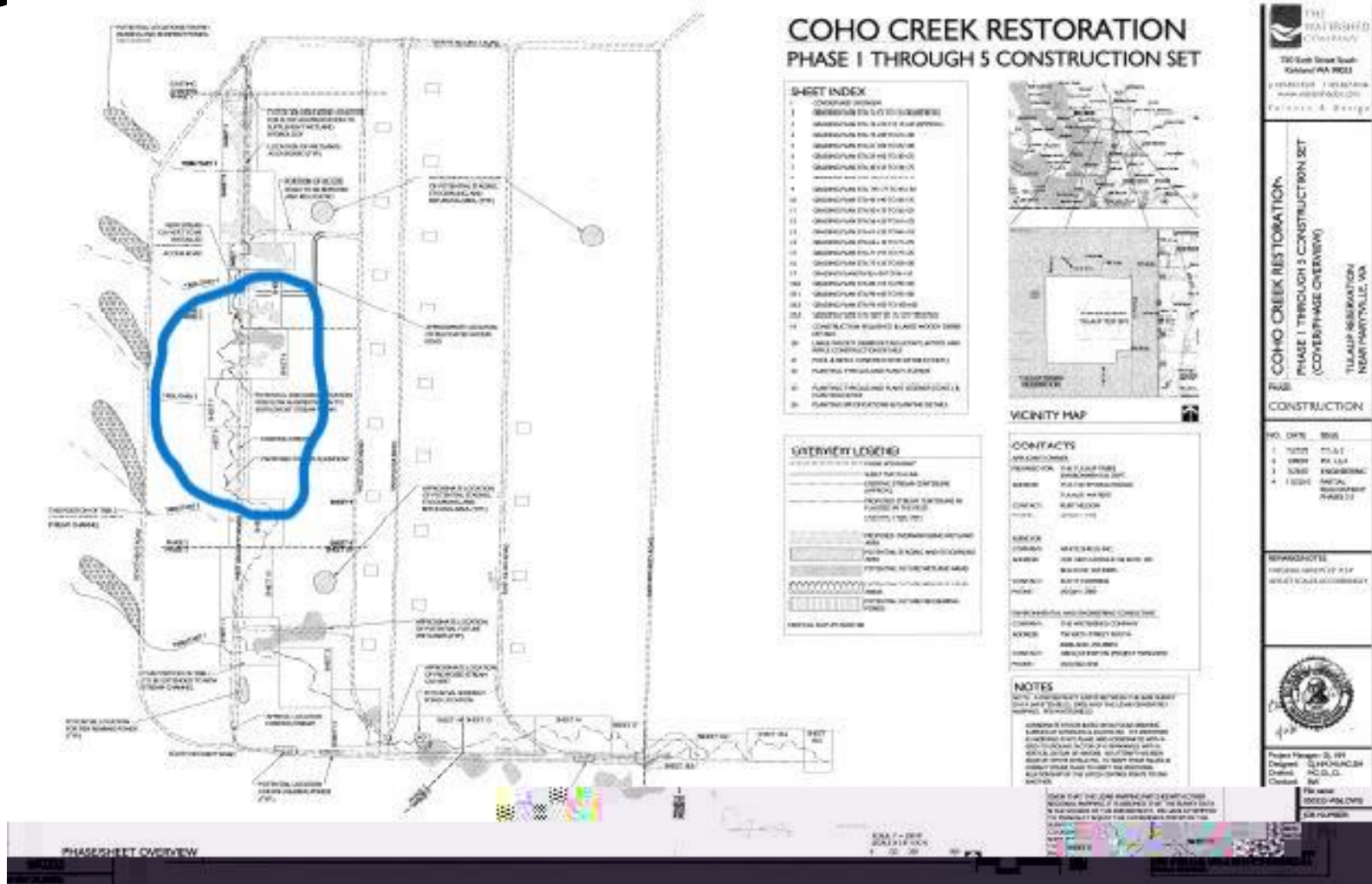


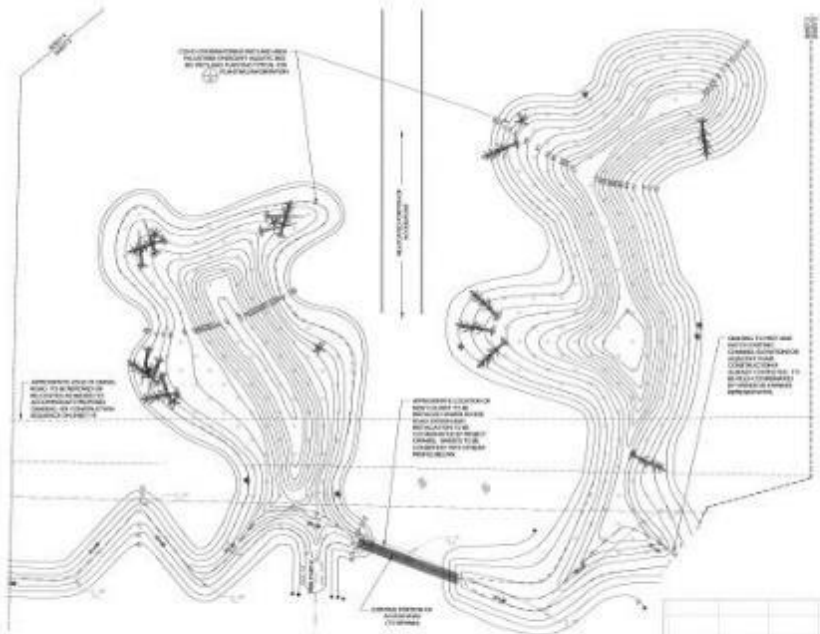
1961 Aerial - Post WWII US Army Occupation



Boeing Site History

2007- Phase 1 Coho Creek Restoration Project



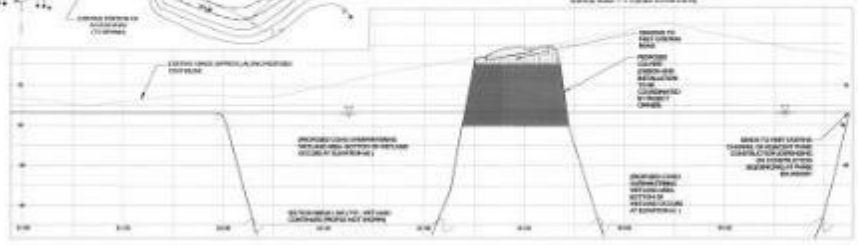


**GRADING PLAN
STA 21+00 TO 25+00**

SCALE: 1" = 40' (VERTICAL SCALE)

GRADING LEGEND

- PROPOSED GRADING (CONTOUR)
- EXISTING GRADING (CONTOUR)
- PROPOSED CHANNEL
- PROPOSED EROSION CONTROL
- PROPOSED STRUCTURE
- PROPOSED FILL
- PROPOSED CUT
- PROPOSED DRAINAGE
- PROPOSED ROAD
- PROPOSED UTILITY
- PROPOSED FENCE
- PROPOSED SIGN
- PROPOSED LIGHT
- PROPOSED TREE
- PROPOSED PLANT
- PROPOSED ANIMAL
- PROPOSED BIRD
- PROPOSED INSECT
- PROPOSED MAMMAL
- PROPOSED REPTILE
- PROPOSED AMPHIBIAN
- PROPOSED FISH
- PROPOSED MOLLUSK
- PROPOSED CRUSTACEAN
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RED WATERSHED COMPANY
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Kirkland, WA 98033
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www.redwatershed.com

CONSTRUCTION

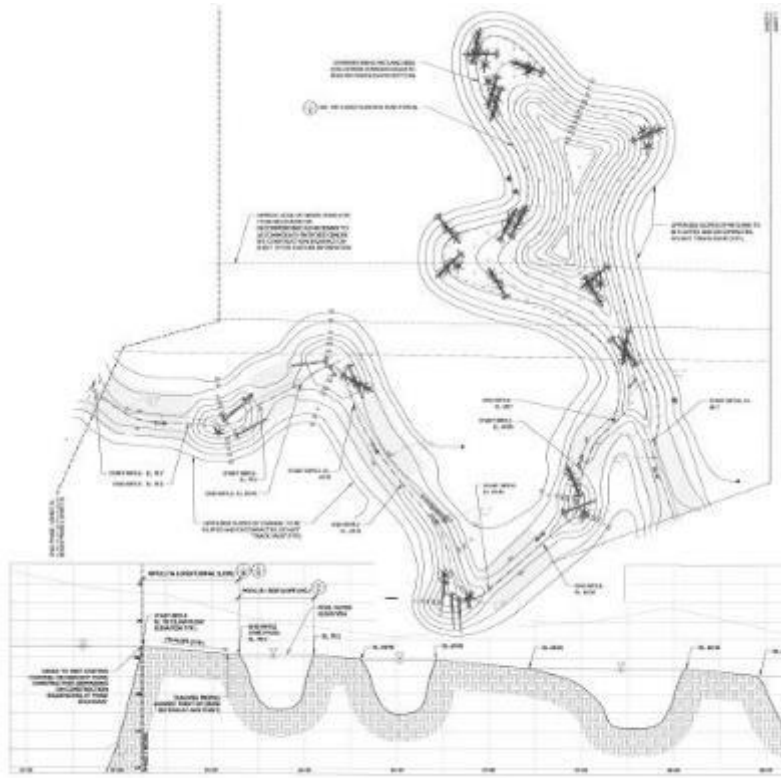
NO.	DATE	REVISION
1	5/20/20	PL 1.0
2	5/20/20	PL 1.0
3	5/20/20	PL 1.0
4	1/15/21	PL 1.0

APPROVED FOR CONSTRUCTION
DATE: 01/15/21
BY: [Signature]

PROJECT INFORMATION
PROJECT: COHO CREEK RESTORATION
PHASE: PHASE 1 THROUGH 3 CONSTRUCTION SET
LOCATION: TULALUP WATERSHED, NEAR PORTVILLE, WA

PROJECT NUMBER: 050023

SHEET NUMBER: 5 OF 27

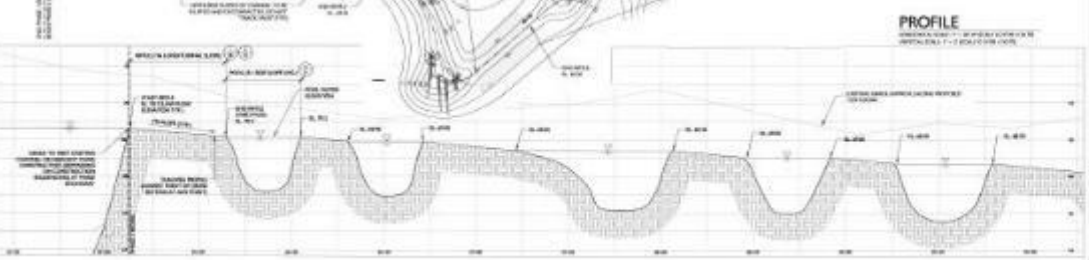


**GRADING PLAN
STA 25+00 TO 30+25**

SCALE: 1" = 40' (VERTICAL SCALE)

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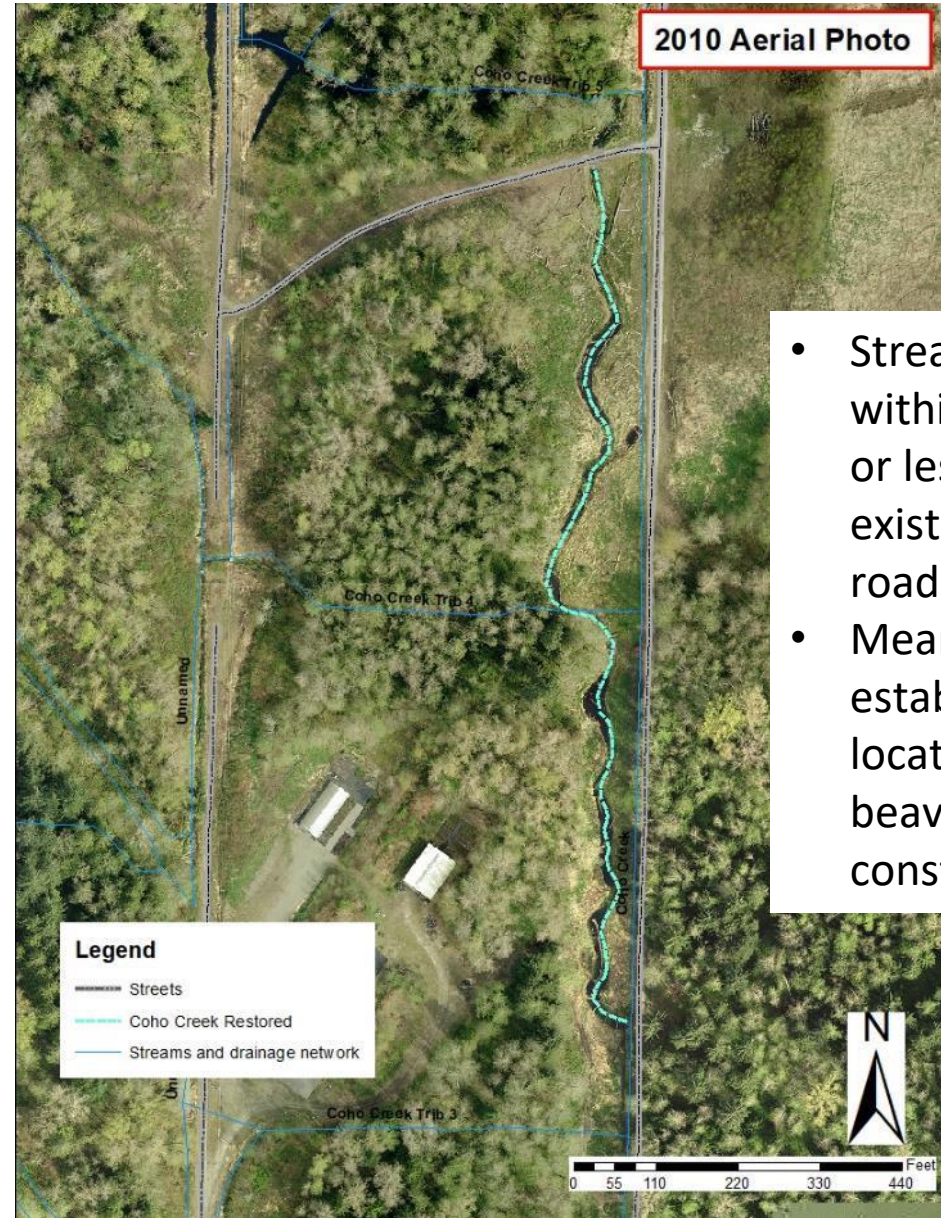
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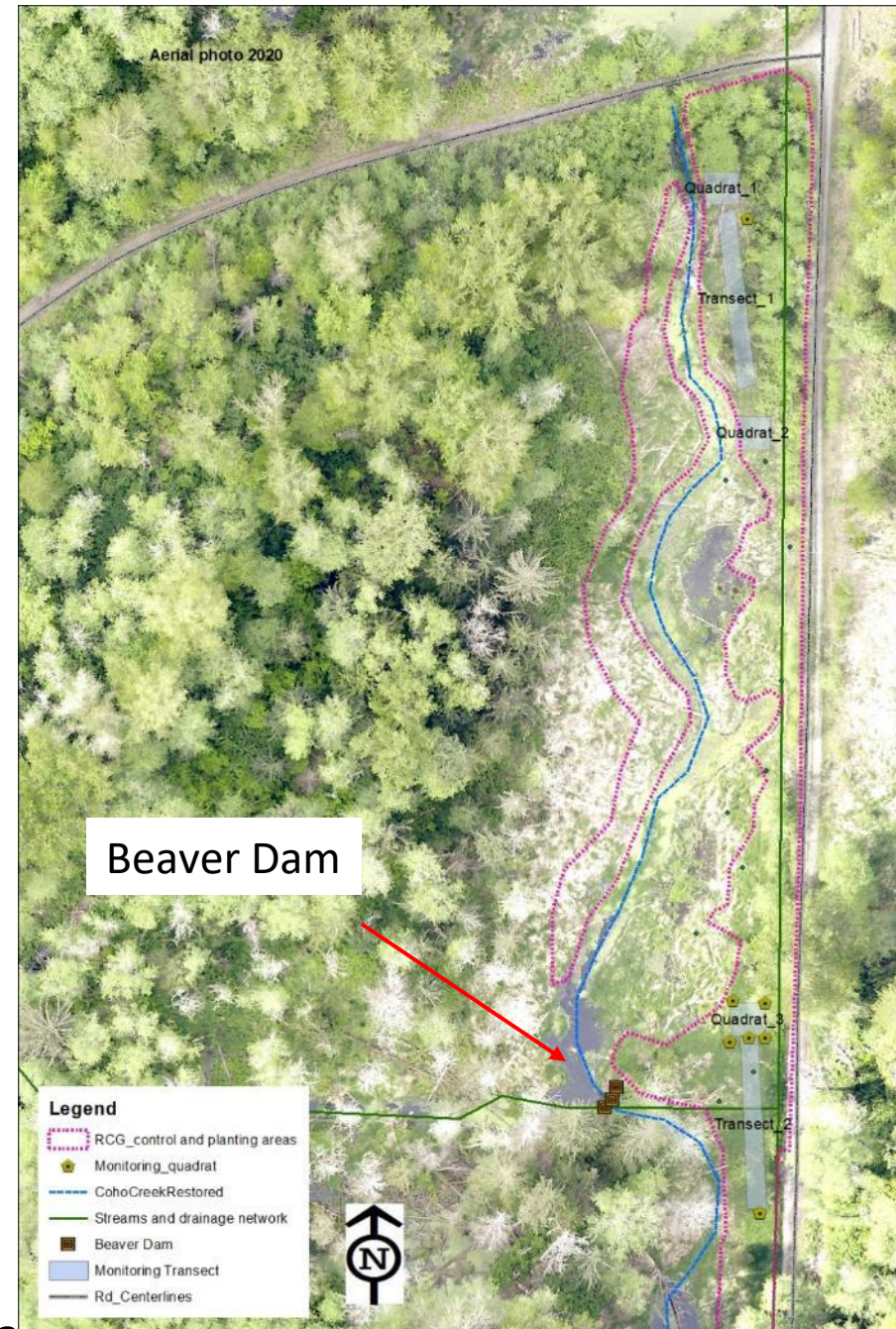
Restoration time line

- Original Restoration 2007-2008
 - A run of fish was re-established almost immediately.
 - Plantings of willows, red osier dogwood, western white pine, sitka spruce and alder.
 - Limited maintenance and mowing after 3 years
 - Beaver took most of willows and site became overgrown with reed Canarygrass.



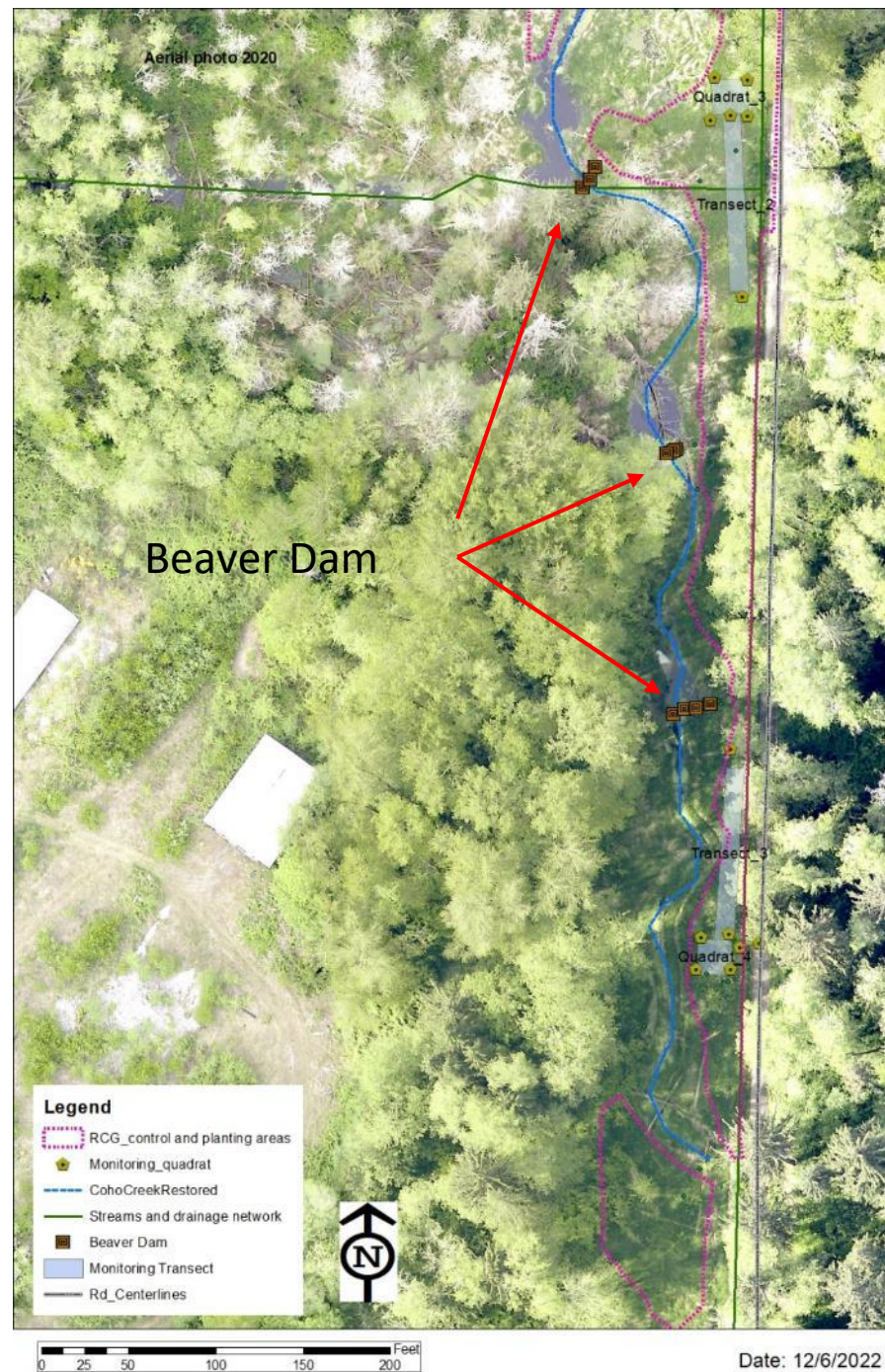
- Stream is restored within only 50 feet or less of the existing gravel road.
- Meanders established good locations for beaver dams to be constructed.

- 2018 – begin mowing and planting- Sitka spruce and western red cedar, western crabapple, and willows
- Fall 2019 – Additional plantings
- Spring 2020-2024 – Additional plantings: Sitka spruce, western red cedar, red osier dogwood, twinberry, pacific ninebark, crabapple, wapato, sedges and rushes, and willows.



North end Restoration Area

- Beaver dams originally blocked fish.

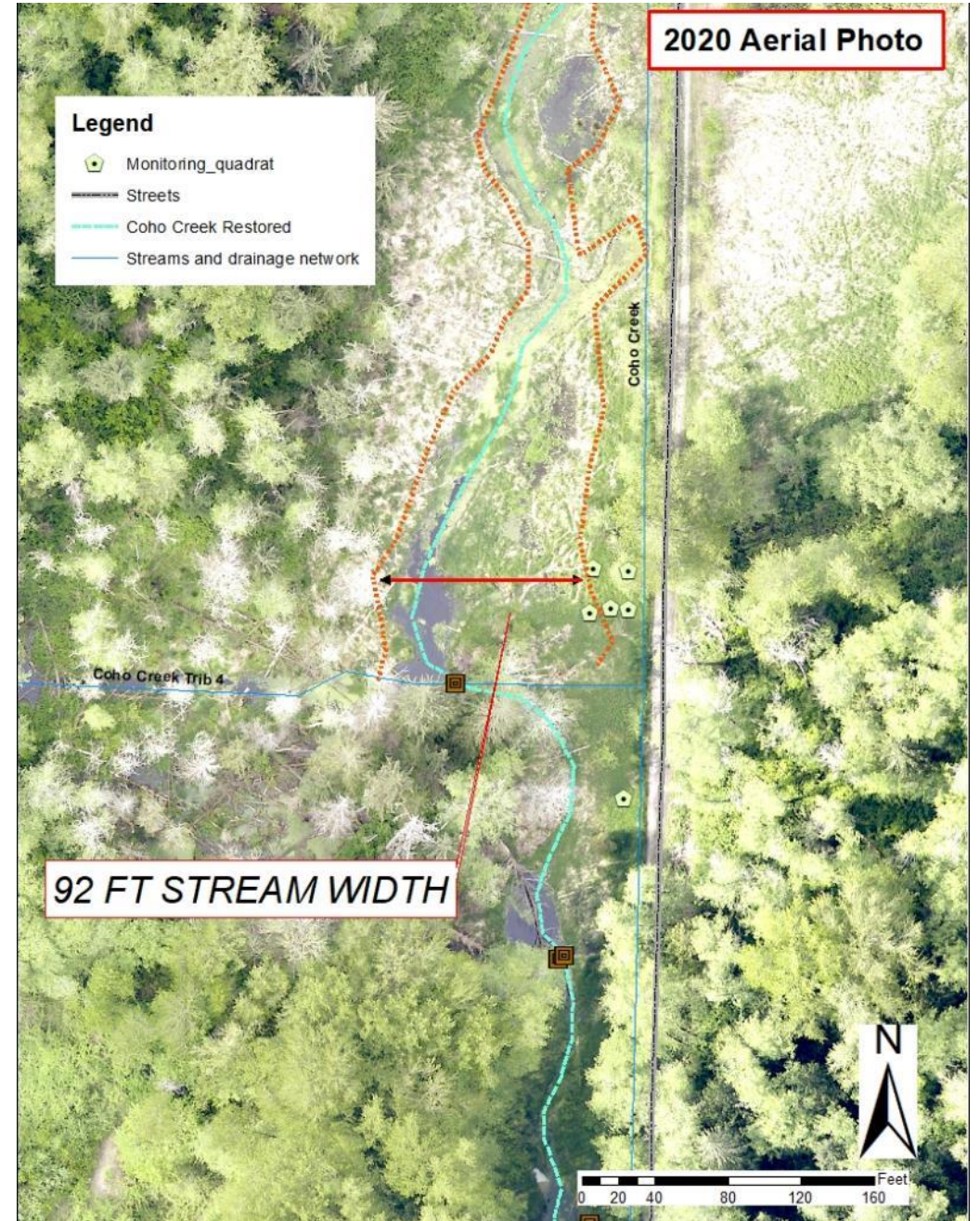
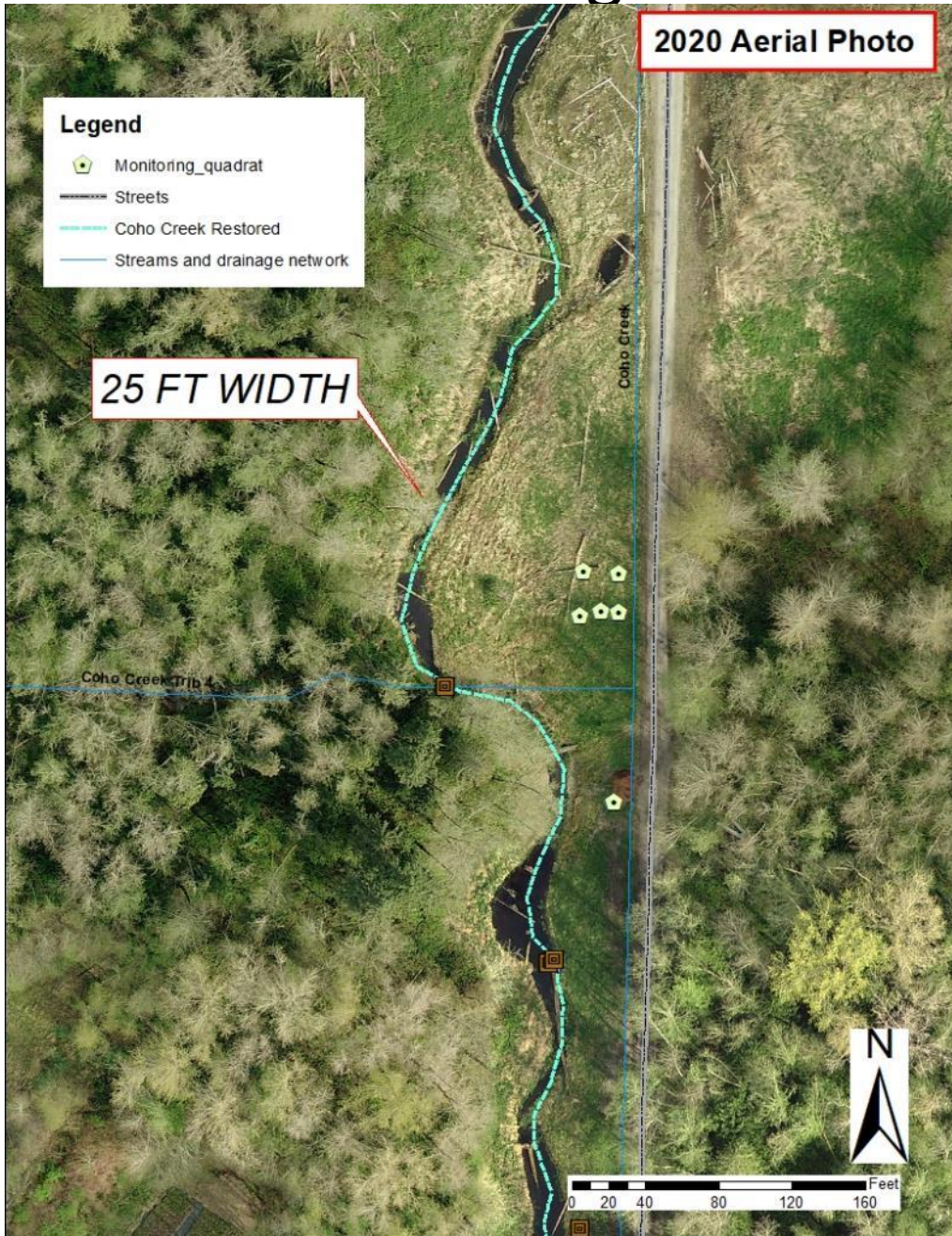


South end Restoration Area

Beaver Dams!



Dramatic changes in stream character



2020- Early spring



Dramatic changes in stream character



Dramatic changes in stream character



Flooding!



2022 Beaver Management Plan

Quilceda Village Beaver Management Plan June 4, 2021

Prepared by Allison Warner,
QCV Wetland Program Coordinator



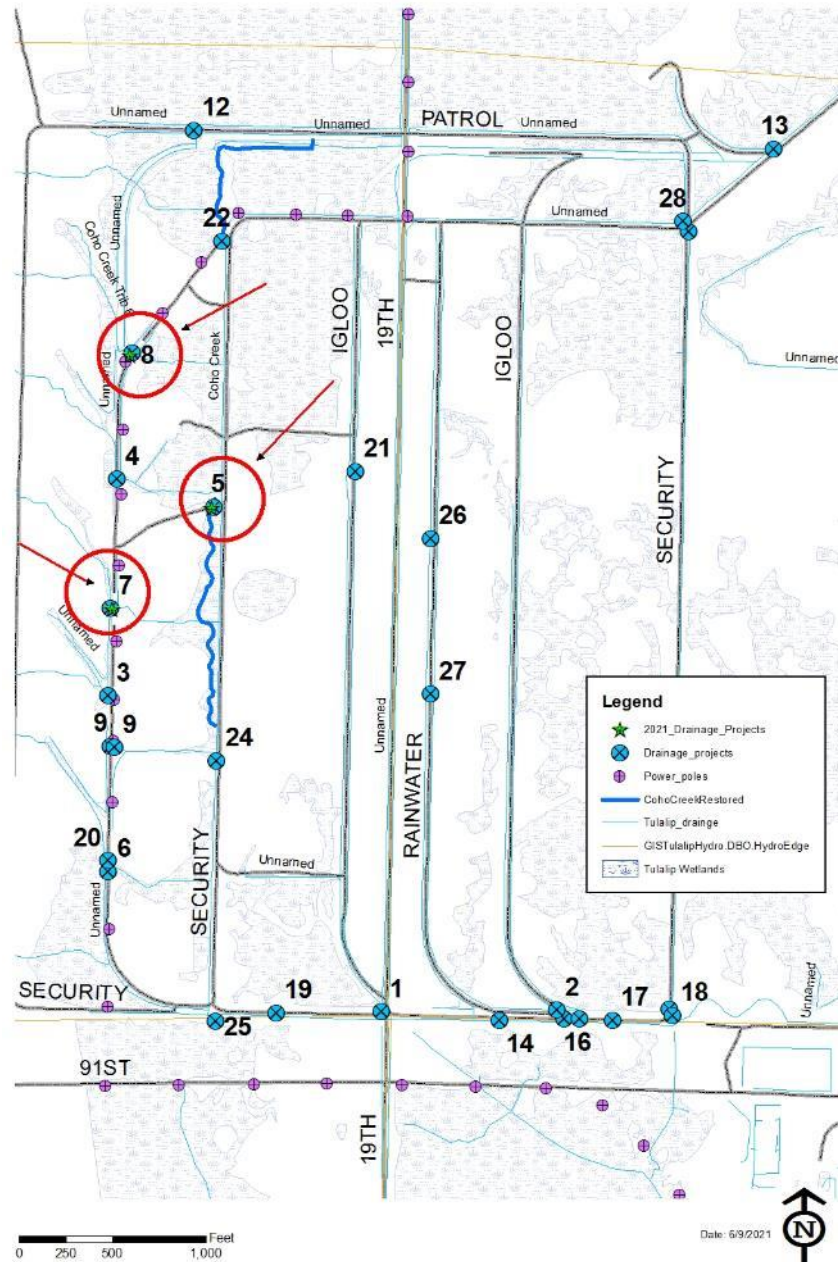
2022 Beaver Management Plan

QUIL CEDA VILLAGE – COHO CREEK BEAVER MANAGEMENT PLAN

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Culvert
removals or
replacements
to improve fish
passage and
stop road
flooding



NEDS- Fish Passable Beaver Deceivers

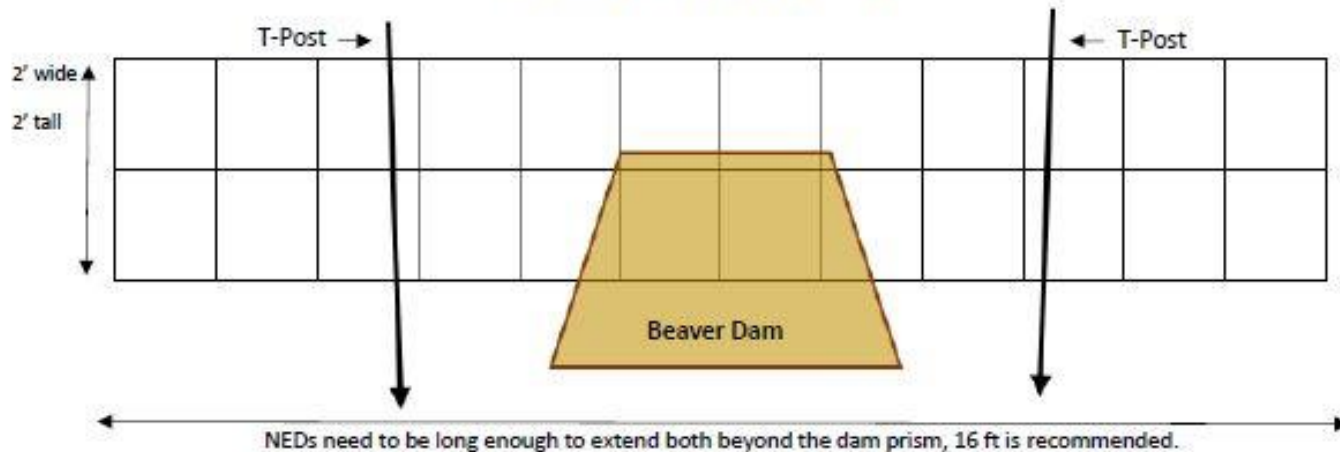
NOTCH EXCLUSION DEVICE-NED



First prototype of NED 16' length x 2' wide, not enclosed

Newest prototype of NED 16' length x 2' wide x 2' height, enclosed

Notch Exclusion Device (NED)-sketch

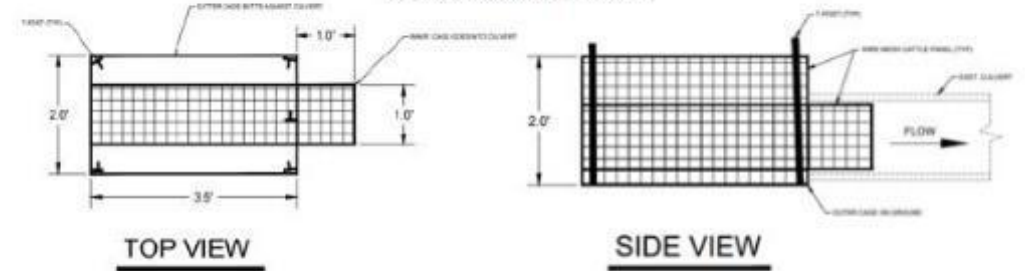


Notch Exclusion Devices or NED's are constructed using 6"x 8" gap cattle panel which complies with WDFW guidelines for fish passage through the structure.

Double Exclusion Cage



Double Exclusion Cage-Sketch



Double Exclusion Cages are constructed using 6"x 8" gap cattle panel which complies with WDFW guidelines for fish passage through the structure. These devices are to be assembled to fit the site. These can be removed and moved elsewhere if needed. The inner cage is built to fit inside of the culvert, while the outer cage is larger, so it fits flush up against the culvert inlet.



Constructing Beaver Deceivers



Beavers Defeat NEDs!



Adaptive Management and Stewardship

Planting and More Planting



Spring 2020 Planting with Heritage High School

Coho Creek Volunteer Day

Student and Community
Riparian Planting

February 23, 2022
1 PM -2 PM

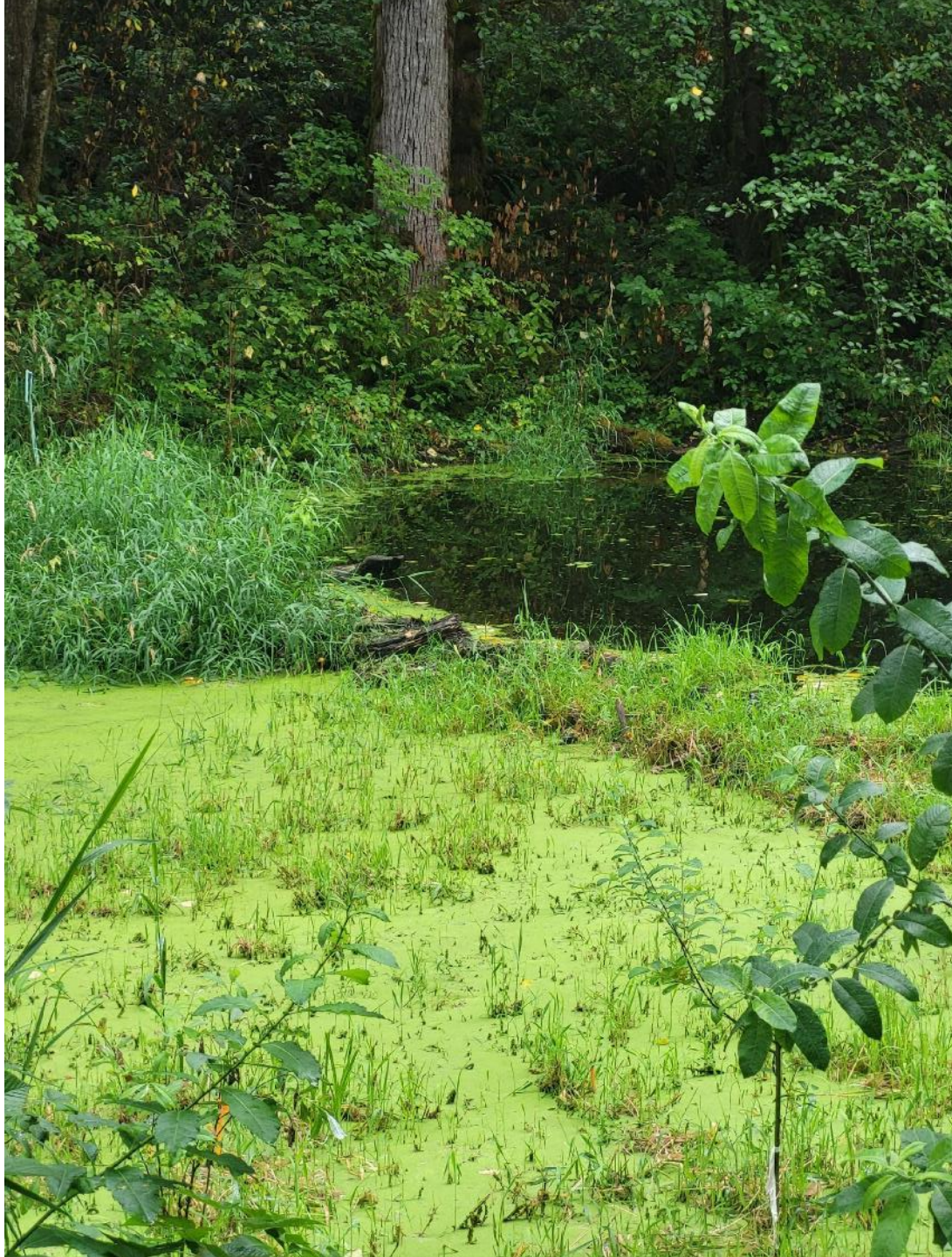
Come and help us restore this beautiful creek for the fish and wildlife. Learn about how the creek's web of life is connected. Snacks provided

Fencing and More Fencing



Beaver have improved stream and habitat despite reducing planting area





Fish Passage Restored



March 2020- Vs Fall 2022- Transect 3



2022- VS 2023 Transect 3 Fall monitoring



2023 vs 2022- Fall monitoring





2024 vs 2022 Transect 1 monitoring

Year 6- Starting to see canopy closure



Transect 3 –view center to W from road

Beaver stay active at the site



Beaver coppicing! Helps canopy closure!



Quadrat 3 View from SW corner to E



In Summary...

- Beaver are a great bonus for restoration sites
- Adjust planting plan for changed hydrologic conditions- and to reduce beaver browse- plan for successive planting years if possible to see how conditions evolve
- Protect large diameter mature trees in the vicinity!
- Allow some beaver browse on small diameter willow stems for coppicing
- Fencing needs to be adjusted as the willows and other trees grow

In Summary...

- PLAN FOR BEAVER at your restoration sites if you are working in a riparian area (or riparian adjacent wetland). There are new tools for predicting beaver and hydrologic changes at various locations on the stream
- Long term stewardship is needed- sites rarely achieve performance standards within 3 years or 5 years! And should have maintenance and monitoring since most sites aren't pristine and subject to weed invasions etc
- Agencies should be funding long term maintenance and monitoring for **RESTORATION** sites as well as mitigation sites- comply with the 2008 Mitigation Rule!
- If agencies aren't able to fund long term maintenance, should be a required match for restoration funds.

